## Exercise 8-2

This exercise uses D & C Manager to plot the plan view elements for Route 63 (Chain RTE63) and the outer road (Chain ROAD1). Some are shown on the plan sheets, which are plotted in plan_j2p0200.dgn, while others are needed only to process the proposed cross sections. These are plotted in patterern_shape_j2p0200.dgn.

1. Open the MicroStation file **t:\de-proj\randolph\j2p0200\data\plan_j2p0200.dgn**.

2. Open the GEOPAK project **t:\de-proj\randolph\j2p0200\project\j2p0200.prj** using Job **cui**. To do this, open the dialog shown below and go to **Projects > Edit**.
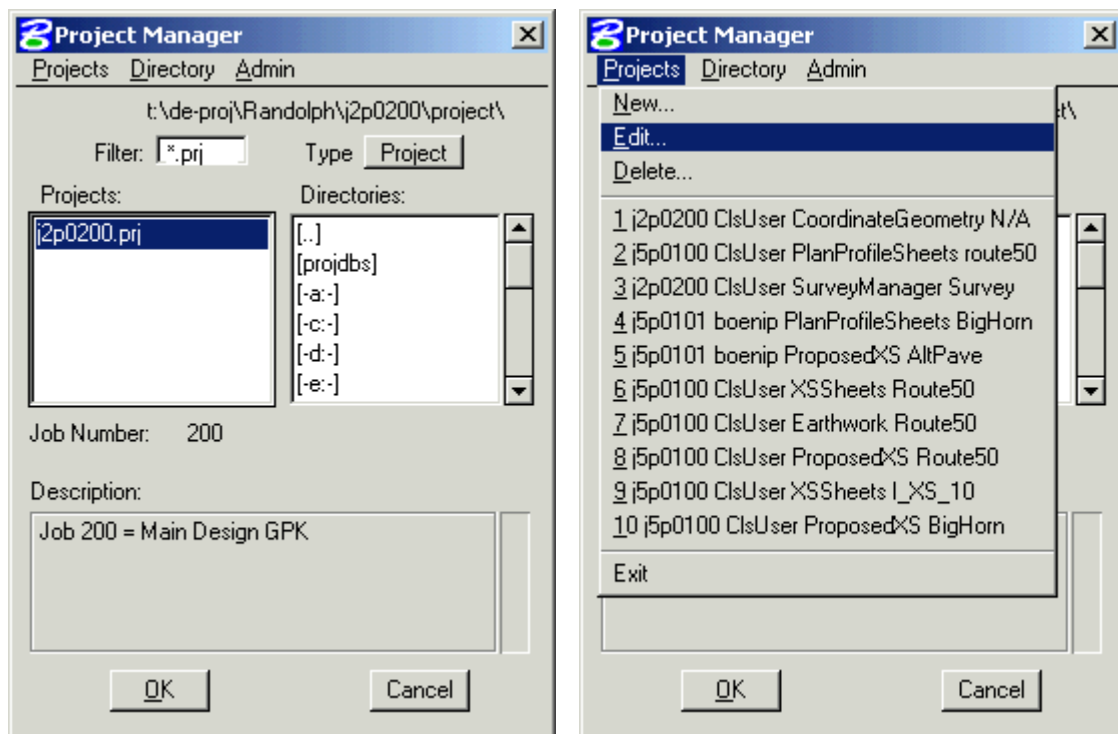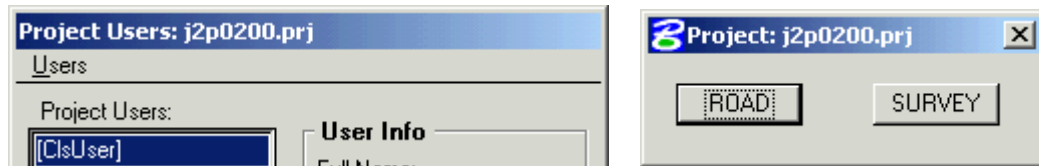

This will bring up the dialog shown to the right. Switch the **Job Numbe**r to **cu1**, which can either be typed or chosen by using the Select button to the right of the Job Number field. If you wish, you may edit the Project Description to include information on Job cu1.
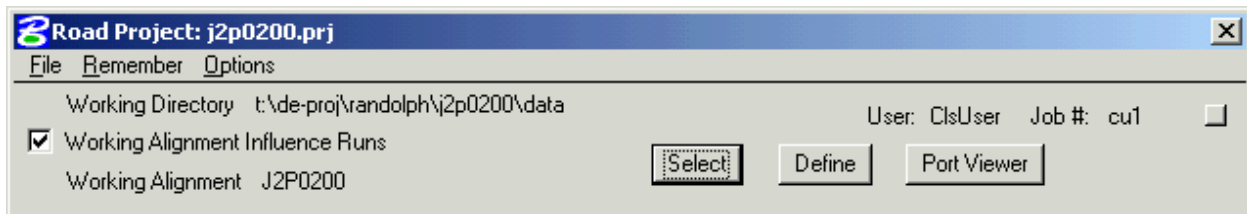
Chick OK in the Project Info Edit dialog and in the Project Manager dialog.
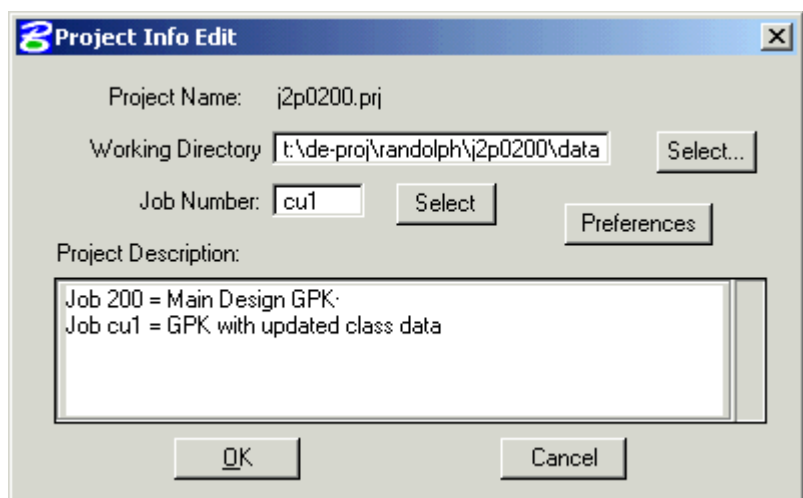
3. Select **ClsUser** and enter **Road**.

4. Since chains have now been defined for the two alignments, create a working alignment for each chain by copying the working alignment J2P0200. To do this click on the **Select** button in the Road Project dialog. .

Copy the J2P0200 Working Alignment / Run and call the new run **Rte63**. Enter the new working alignment and click on **Define** to enter the Working Alignment Definition. In **Plan View** section of the working alignment definition, **select Chain: RTE63**. Click **OK** to save the changes to the alignment definition.
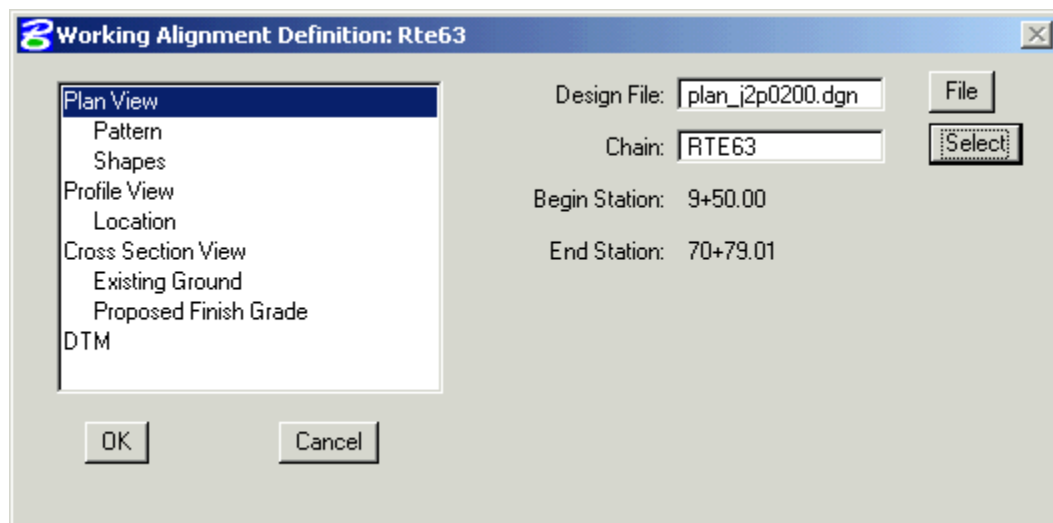

Repeat the process for the outer road. Copy the J2P0200 working alignment and name the new run **Road1**. Enter the new working alignment. In **Plan View** section of the **Working Alignment Definition**, **select Chain: ROAD1**. Click **OK** to save the changes to the alignment definition.

5. The first step is to plot the alignments. Open the **Design and Computation Manager** dialog.

   Select the item **English/Drafting Standards/Plan/Alignments/MoDOT Proposed Baseline**

   Select the **Draw Plan & Profile** button
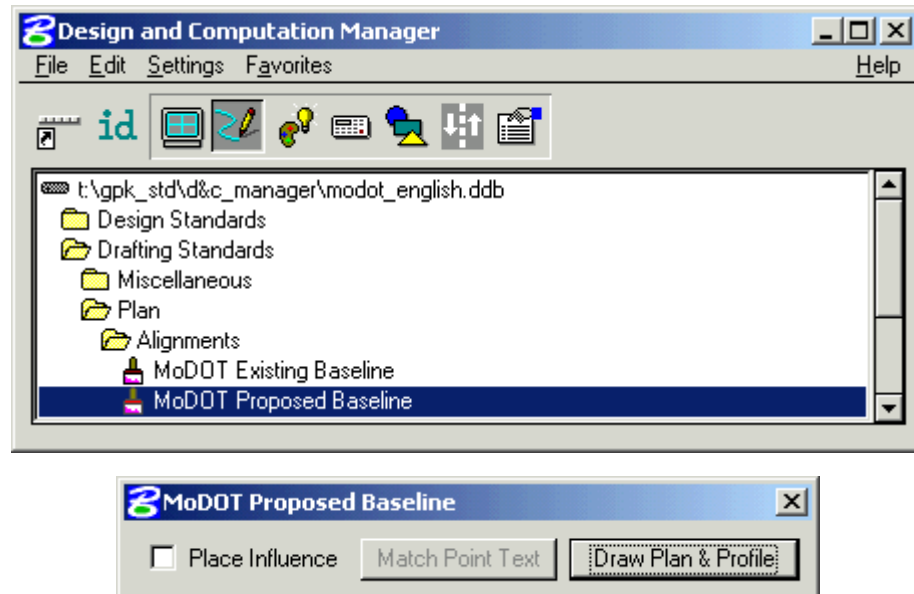
6. Select the **Chain** Operation.

   Set the **Labeling Scale** to **50**

   Check that the following items are checked:
   Line Direction
   Curve Label
   Curve Data
   Spiral Label
   Spiral Data

   Select the Chains **RTE 63** and **ROAD1**.
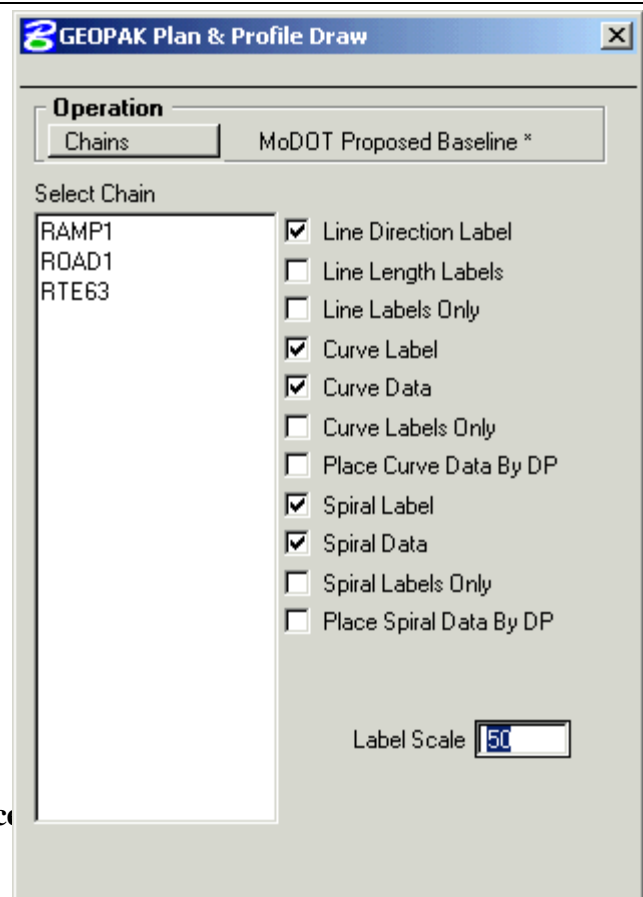
   Switch the Operation to **Stationing**.

   Check that the following items are checked:
   Tick Marks
   Tick Mark Stations
   PC & PT & CS … Labels
   PI Labels

   Set the following options:
   Small Ticks: **Ticks LT, Labels LT**
   Large Ticks: **Ticks Both, Labels LT**
   Control Point Labels: **As Per Preference**

   Select the Chains **RTE 63** and **ROAD1**.

7. Based on the typical section for Route 63 (see the separate handout), there are three possible locations for the edge pavement line next to the median. Because the shoulder next to the median is an A1 shoulder with no joint between the pavement and shoulder, one option is to place the edge of pavement line at the median edge of shoulder (offsets -26' & 26'). The second option is to place the pavement edge 2' into the shoulder (offsets -28' & 28'). The last option, which is the one used for this exercise is to place the edge of pavement at the edge of the driving line (offsets -30' & 30'). This taken into consideration, the offsets for the edge of pavement are –56 (-26-30), -30, 30, and 56. Use the **Draw Transition** tool to create the edges of pavement for chain **RTE63** with the following parameters.

Use the **Design and Computation Manager** item:
Design Standards\Roadway\EOP New – Edge of Pavement (New).
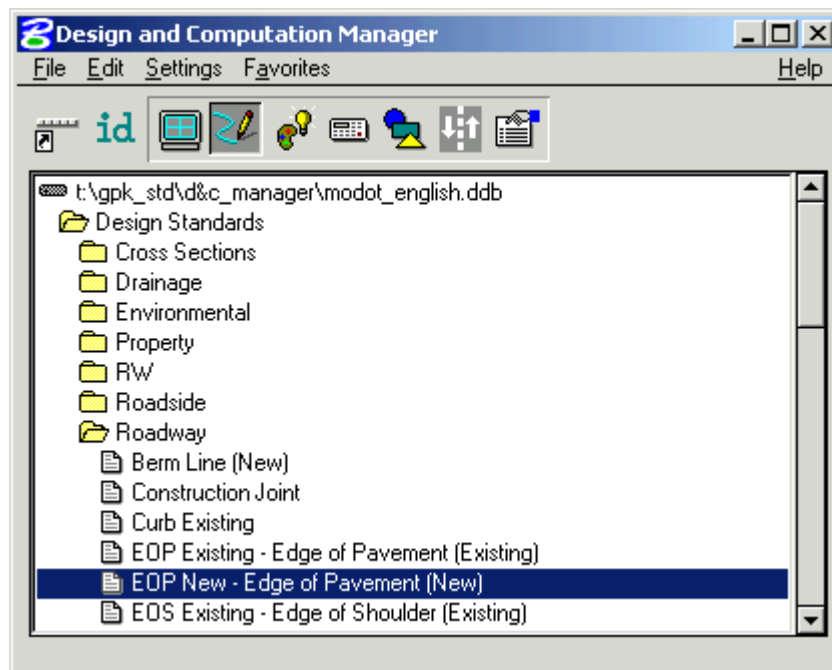
Be sure that **Place Influence** is turned on.
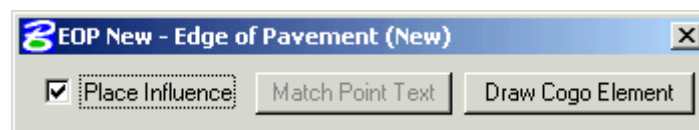
Use the following settings in the Draw Transition Tool:

Beginning Station	Beginning Offset	Ending Station	Ending Offset
Start of Chain	-56	End of Chain	-56
Start of Chain	-30	End of Chain	-30
Start of Chain	30	End of Chain	30
Start of Chain	56	End of Chain	56

8. Use the **Draw Transition** tool to create the edges of outside shoulder for **Route 63** with the following parameters. From the typical section there is no separated paved shoulder on the median side; therefore, the offsets are –64 (-56-8), -26, 26 and 64.

Use the **Design and Computation Manager** item:
Design Standards\Roadway\EOS New Conc. – Edge of Shoulder - Concrete (New).

Be sure that **Place Influence** is turned on.

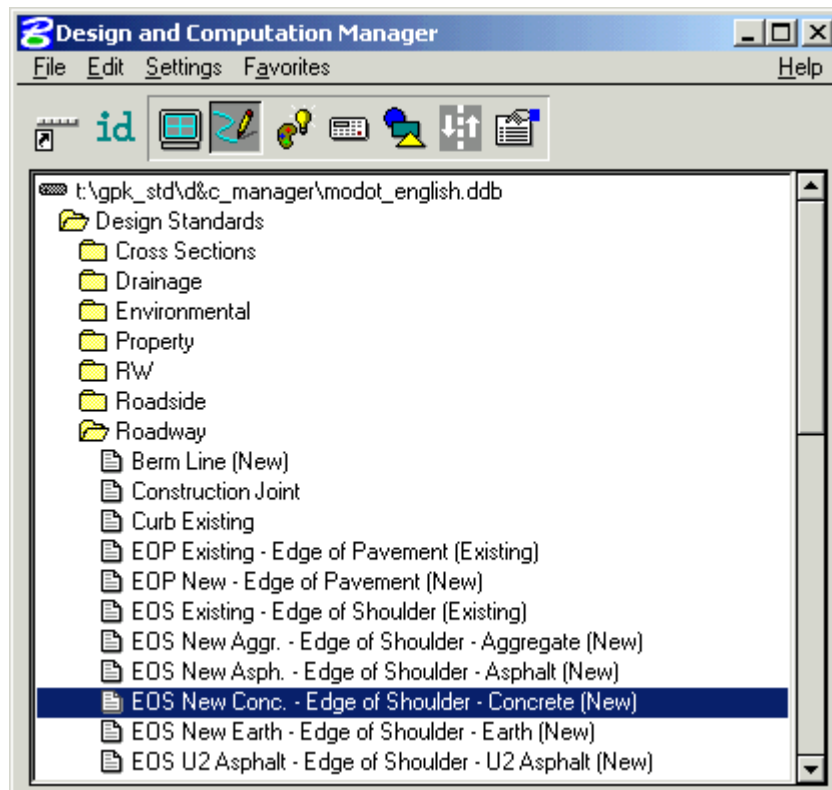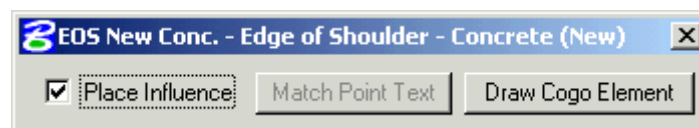Use the following settings in the Draw Transition Tool:

Beginning Station	Beginning Offset	Ending Station	Ending Offset
Start of Chain	-64	End of Chain	-64
Start of Chain	-26	End of Chain	-26
Start of Chain	26	End of Chain	26
Start of Chain	64	End of Chain	64

Save the changes to the DGN file.

9. The typical section for Route 63 also indicates that there is a retaining wall on the left side from Sta. 13+90 to 16+10 with the face of the wall 70 feet to the left of the centerline of the median. Use the **Draw Transition** tool to create the line for the retaining wall.

    Use the **Design and Computation Manager** item:
    Design Standards\Safety and Structures\New Retaining Wall.
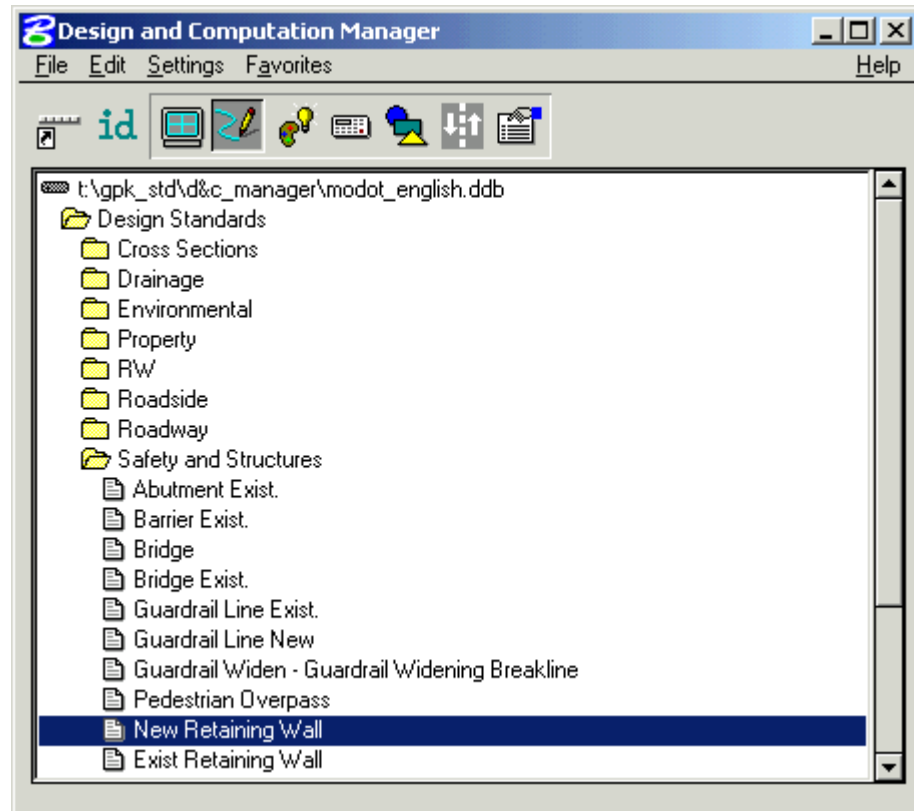
    Be sure that **Place Influence** is turned on.

    Use the following settings in the Draw Transition Tool:

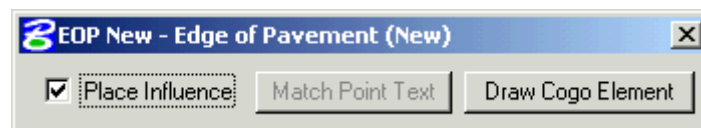| Beginning Station	Beginning Offset	Ending Station	Ending Offset
13+90	-70	16+10	-70

10. There is a Type A Gutter behind the retaining wall, which is 1' thick. Therefore, the gutter is at an offset of 71' to the left. Use the **Draw Transition** tool to create the line for the gutter.

   Use the **Design and Computation Manager** item:
   Payitems\Roadway\Curb\609-10.41 Concrete Gutter Type A.

   Be sure that **Place Influence** is turned on.
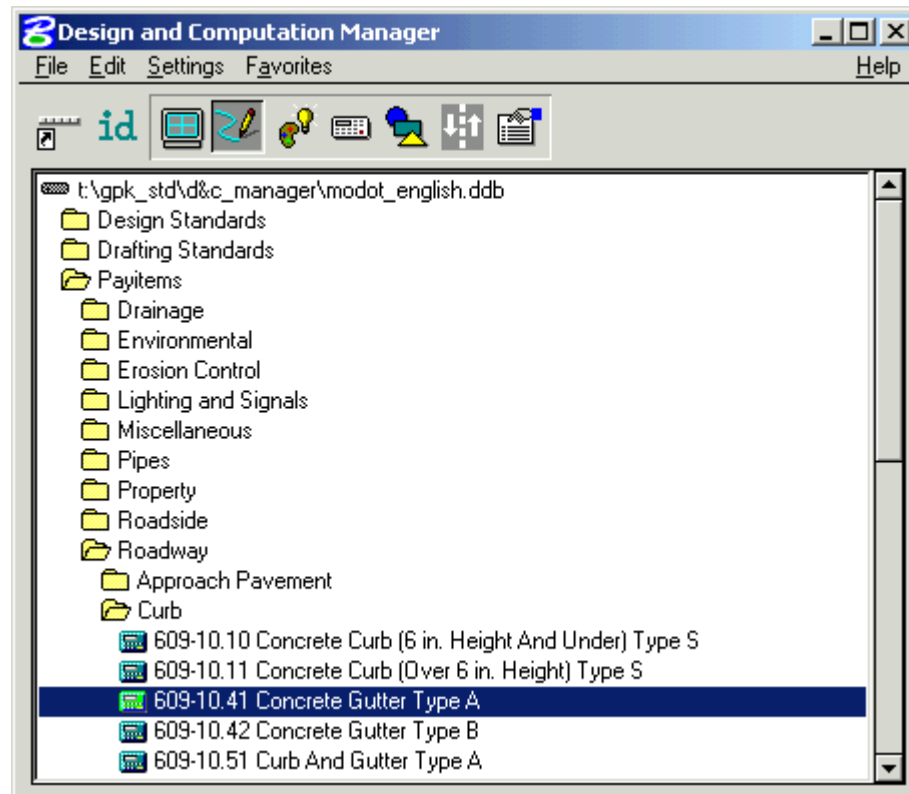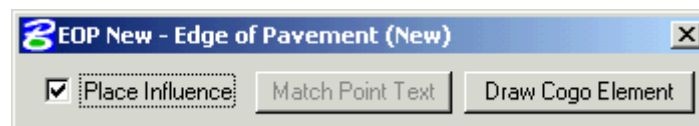

   Use the following settings in the Draw Transition Tool:

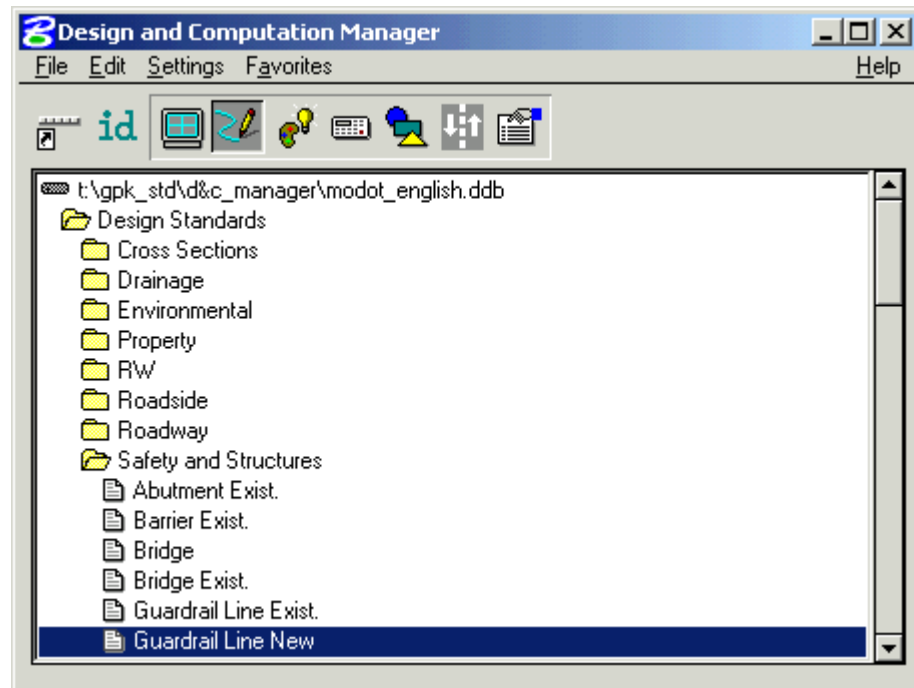| Beginning Station	Beginning Offset	Ending Station	Ending Offset
13+90	-71	16+10	-71

11. The typical section for Route 63 also indicates that there is guardrail on the project. It is from Sta. 44+74 to Sta. 50+36 on the left and from Sta. 44+74 to Sta. 49+31 on the right. The face of both guardrails is at the edge of shoulder.

Because of the way in which the guardrail line is drawn, the station range for the right side needs to be reversed with slightly varying offsets for the post to be on the outside. Because part of it is in a spiral, the straight and spiral portions are plotted separately.
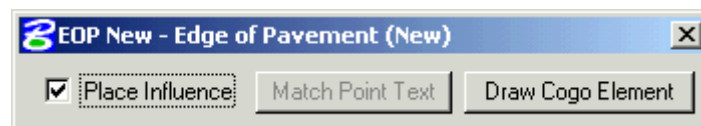
Use the **Draw Transition** tool to create the line for the retaining wall using the stations and offsets listed at the end of this step.

Use the **Design and Computation Manager** item:
Design Standards\Safety and Structures\Guardrail Line New.

Be sure that **Place Influence** is turned on.

Use the following settings in the Draw Transition Tool:

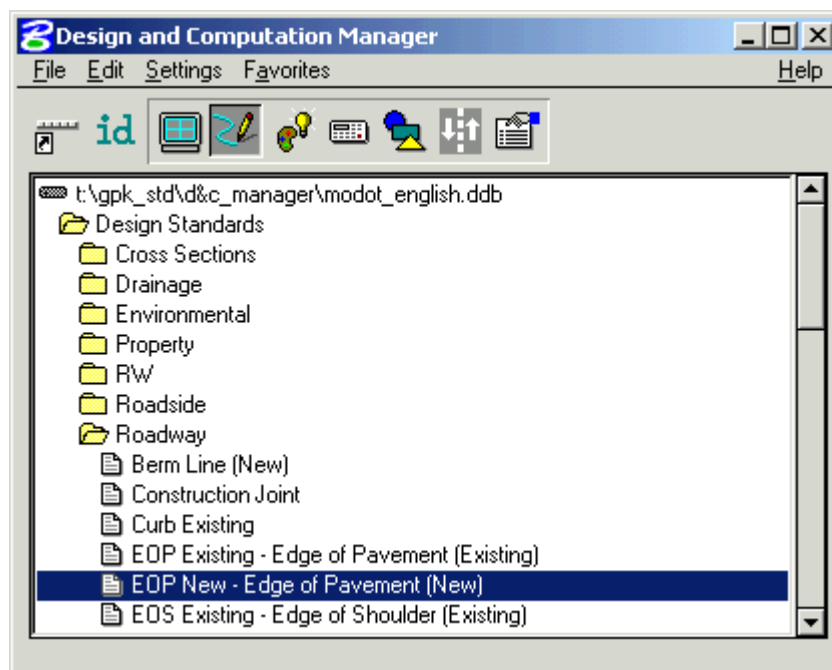| Beginning Station	Beginning Offset	Ending Station	Ending Offset
44+74	-64	50+36	-64
49+31	64	46+41.48	64.00001
46+41.48	64.00001	44+74	64

Note: Turn off Place Influence or exit D&C to use the Shift mode in the **MicroStation Modify Line Style Attributes** tool.

The last item to be plotted for the Route 63 alignment is the guardrail widening, which will be drawn as a berm line. Since this line needs to be placed in a different file, it will be plotted later.
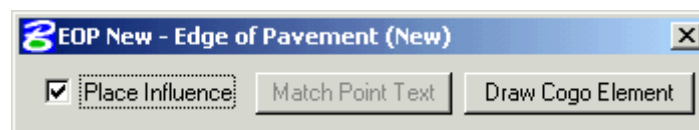
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12. Based on the typical section for the outer road (see the separate handout), the offsets for the edge of pavement are –12 and 12. Use the **Draw Transition** tool to create the edges of pavement for **ROAD1** with the following parameters.

Use the **Design and Computation Manager** item:
Design Standards\Roadway\EOP New – Edge of Pavement (New).

Be sure that **Place Influence** is turned on.

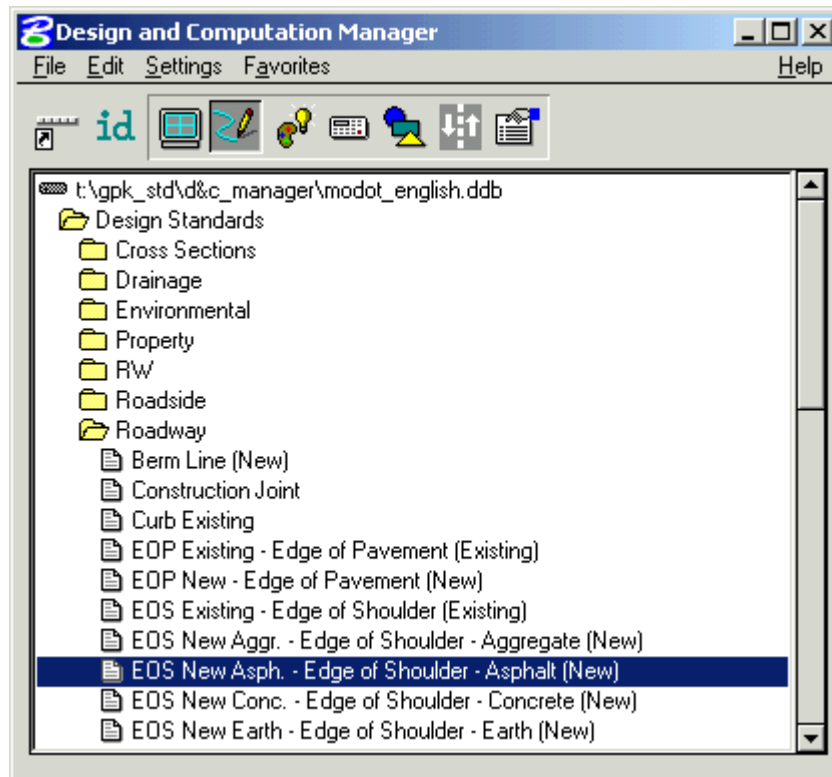Use the following settings in the Draw Transition Tool:

Beginning Station	Beginning Offset		Ending Station	Ending Offset
Start of Chain	-12		End of Chain	-12
Start of Chain	12		End of Chain	12

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13. Use the **Draw Transition** tool to create the edges of shoulder for **ROAD1** with the following parameters.

Use the **Design and Computation Manager** item:
Design Standards\Roadway\EOS New Asph. – Edge of Shoulder - Asphalt (New).

Be sure that **Place Influence** is turned on.
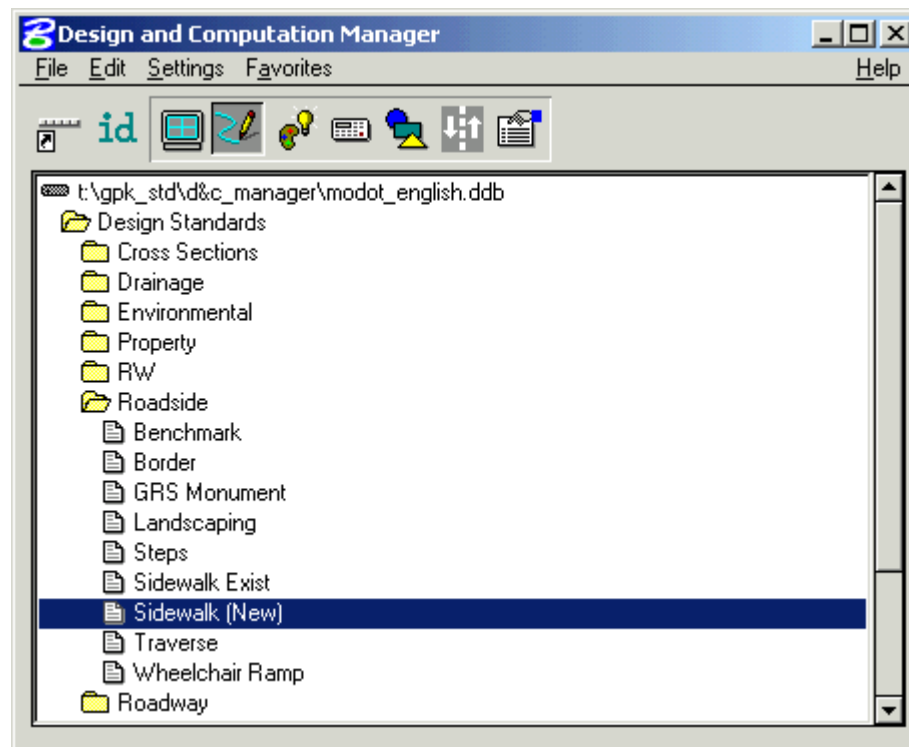

From the typical section, shoulder exists only from Sta. 25+30.00 to the end of the project. Use the following settings in the Draw Transition Tool:

Beginning Station	Beginning Offset	Ending Station	Ending Offset
25+30.00	-18	End of Chain	-18
25+30.00	18	End of Chain	18

14. There is a sidewalk on the left side of the outer road from Sta. 0+00 to Sta. 25+30. The inside edge of sidewalk is at the back of the curb. The outside edge has an offset of 20' (12 + 3+5). Use the **Draw Transition** tool to create the outside edge of sidewalk for **ROAD1** with the following parameters.

Use the **Design and Computation Manager** item:
Design Standards\Roadside\Sidewalk (New).
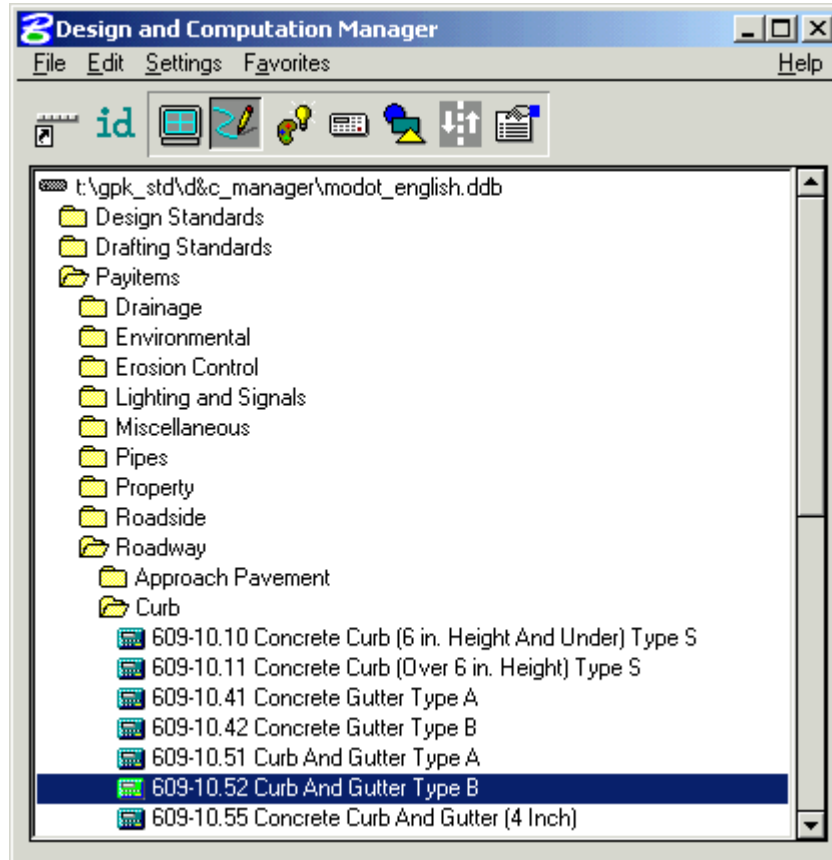

Be sure that **Place Influence** is turned on.

Use the following settings in the Draw Transition Tool:

Beginning Station	Beginning Offset	Ending Station	Ending Offset
Start of Chain	-20	25+30	-20

15. Use the **Draw Transition** tool to draw the curb for **ROAD1** with the following parameters.

   Use the **Design and Computation Manager** item:
   Payitems\Roadway\Curb\609-10.52 Curb And Gutter Type B

   Be sure that **Place Influence** is turned on.

   Use the following settings in the Draw Transition Tool:

Beginning Station	Beginning Offset	Ending Station	Ending Offset
Start of Chain	-15	25+30	-15
Start of Chain	15	25+30	15

   Save the changes to the DGN file.

This completes the lines needed to show the roadway in the plan sheets for Route 63 and the outer road. The typical section for the outer road indicates that there is a berm behind the curb and gutter. One option for indicating the width of the berm is to draw a plan view element at the outside edge of the berm, which is the option that will be used. Since this line is not shown on the plan sheets, it will be plotted in a different file.

16. Open MicroStation file **t:\de-proj\randolph\j2p0200\data\pattern_shape_j2p0200.dgn**. This file is used to plot any needed plan view elements that are not to be shown of the plan sheets, including the edge of berm line, the pattern lines to indicate the location of the cross sections and the shapes used to indicate the pavement cross slope.

17. Attach **plan_j2p0200.dgn** as a reference file so you can see the plan view geometry that has already been plotted.
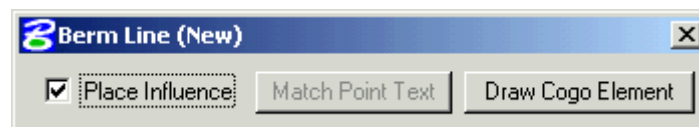
Use the **Draw Transition** tool to draw the edge of berm line behind the curb for **Road1** with the following parameters.

Use the **Design and Computation Manager** item:
Design Standards\Roadway\Bern Line (New)
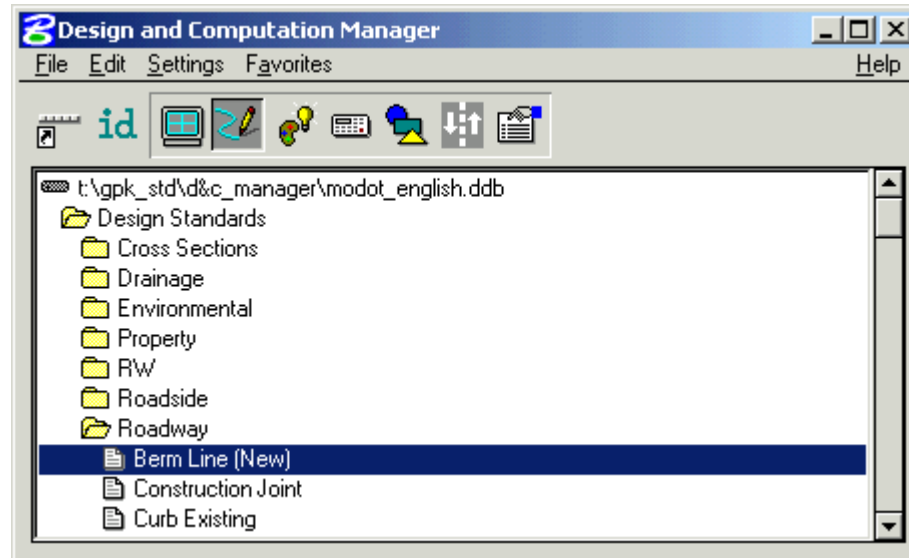
Be sure that **Place Influence** is turned on.

The offsets for the back of the berm are –23' (-12-3-8) on the left and 19' (12+3+4) on the right. Use the following settings in the Draw Transition Tool:

Beginning Station	Beginning Offset	Ending Station	Ending Offset
Start of Chain	-23	25+30	-23
Start of Chain	19	25+30	19

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18. Also drawn as berm line is the guardrail widening for Route 63. The guardrail itself runs from Sta. 44+74 to Sta. 50+36 on the left and from Sta. 44+74 to Sta. 49+31 on the right. Based on MoDOT standard plan 606.00, the width of the widening is 3.5' wide and must be at full width 10' before the start of the guardrail. The taper is also 15:1. This means the taper length is 15 x 3.5 = 52.5'.

On the left side the tapering must start at Sta. 44+21.5 (44+74 – 52.5'); be at full width from Sta. 44+74 to Sta. 50+46 (50+36 + 10'); and the taper ends at Sta. 50+98.5 (50+46 + 52.5').

On the right side the tapering must start at Sta. 44+11.5 (44+74 – 10' – 52.5'); be at full width from Sta. 44+64 (44+74 – 10') to Sta. 49+31; and the tapering ends at Sta. 49+83.5 (49+31 + 52.5').

Use the **Draw Transition** tool to draw the edge of berm line for the guardrail widening for **RTE63** with the following parameters.

Use the **Design and Computation Manager** item:
Design Standards\Roadway\Bern Line (New).

Be sure to change the Chain to **RTE63**.

Beginning Station	Beginning Offset	Ending Station	Ending Offset
44+21.5	-64	44+74	-67.5
44+74	-67.5	50+46	-67.5
50+46	-67.5	50+98.5	-64
44+11.5	64	44+64	67.5
44+64	67.5	49+31	67.5
49+31	67.5	49+83.5	64

Save the changes to the DGN file.